SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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THE LIVES OF MECHANICAL CELEBRITIES.*

To comment upon the attractive style of writing in a work by the author of such well-read and generally-admired books as "Self Help" and "The Lives of the Engineers," would, indeed, be superfluous; more especially when the subject treated is a kindred one, and the author's means of obtaining material are in every way similar; we shall, therefore, content ourselves with endeavouring briefly to give some notion of the general character of the biography. Mr. Smiles tells us that while preparing his "Lives of the Engineers" he frequently came across the tracks of celebrated inventors, mechanics, and ironworkers, whose labours seemed worthy of record. Without exaggerating the importance of this class of biography, it may, at least, be averred that it has not yet received its due share of attention. Without derogating from the biographic claims of those who minister to intellect and taste, those who minister to utility need not be overlooked. When a Frenchman was praising to Sir John Sinclair the artist who invented ruffles, the Baronet shrewdly remarked that some merit was also due to the man who added the shirt. The work before us, after pointing out the intimate connection between iron and civilisation, and tracing the beginnings of the iron manufacture in Britain, gives us interesting biographies of Dud Dudley, and his connection with iron smelting by pit coal; Andrew Yarranton; the Darbys and the Reynoldses, at the Coalbrookdale ironworks; Benjamin Huntsman, and his invention of cast-steel; Henry Cort and his inventions; Dr. Roebuck and David Mushet, and the Scotch iron manufacture; Neilson, and the invention of the hot-blast; Joseph Bramah; Henry Maudslay; Joseph Clement; Fox, of Derby; Murray, of Leeds; Roberts and Whitworth, of Manchester; James Nasmyth; and William Fairbairn.

The earlier chapters, containing the historical narratives indicated by their title, we shall pass by, although abounding with interest, in order at once to reach the biographies of men who have lived almost within our own memory. Until the beginning of the 18th century the art of casting iron had made such small progress in England that we were principally dependent upon imported articles. Abraham Darby determined to discover the secret of success. With this object he went over to Holland in 1706, and after diligent enquiry he ascertained that the only sure method of casting "Hilton ware," as such castings were then called, was in moulds of fine dry sand. This was the whole secret. Returning to Bristol, accompanied by some skilled Dutch workmen, Darby began the new manufacture, and succeeded to his satisfaction. In 1708 he obtained a patent, granting him sole use of the process for 14 years. The other members of the Bristol firm of which Darby was a partner hesitating to embark more capital, Darby withdrew, and in 1709 removed to Coalbrookdale, in Shropshire, with the intention of prosecuting the enterprise on his own account. The castings of Coalbrookdale gradually acquired a reputation, and the trade of Abraham Darby continued to increase until his death, at Matelcy Court, in 1717. It is probable that Darby used raw coal for calcining the ore, but coke only in the process of smelting; but it appears that it was not until the time of Richard Reynolds, who succeeded Abraham Darby the second in the management of the works in 1757, that pit coal came into large and regular use in the blasting-furnaces as well as the fineries of Coalbrookdale. While Richard Reynolds had charge of the works a further improvement was effected in the manufacture of iron by pit coal. In the first process of fusing the ironstone coal had been used for some time with increasing success, but the question arose whether coal might not also be used in the second or refining stage. Two of the foremen, named Cranege, suggested that it might be performed in the reverberatory furnace, and by this method of puddling the manufacturer was thenceforward enabled to produce iron in increased quantity at a large reduction in price, and although the invention of the Craneges was greatly improved upon by Onions, and subsequently by Cort, there can be no doubt as to the originality and the importance of their invention. Mr. Alfred Tylor, the very able reporter on metal work at the Paris Exhibition in 1855, and at the International Exhibition in 1862, states that he was informed by the son of Richard Reynolds that the wrought-iron made at Coalbrookdale by the Cranege process "was very good, quite tough, and broke with a long, bright, fibrous fracture: that made by Cort afterwards was quite different."

The particulars relating to Huntsman, the inventor of the process for making cast-steel of high quality, which has continued with immaterial modifications until the present day, is comparatively meagre; yet the account of the manner in which a less scrupulous manufacturer succeeded in participating in the secret is well worth reading. We are inclined, too, to think that the remark that to produce excellent steel "the great secret is to have the courage to be honest, a spirit to purchase the best material, and the means and disposition to do justice to it in the manufacture," is one which, if acted upon by steel manufacturers generally, would prove far preferable to secrecy, and would tend much to promote improvement. The succeeding chapter is devoted to the inventions of Henry Cort, and we then come to Dr. Roebuck and David Mushet, in connection with the Scotch iron manufacture. Although a Glasgow Cyclopædia of Biography is content with briefly disposing of the former gentleman, the grandfather of the present member for Sheffield, and the man to whom Watt considered himself indebted for being able to develope his inventions, by the lines "Roebuck, John, a physician and experimental chemist, born at Sheffield, 1718; died, after ruining himself by his projects, 1794," Mr. Smiles has rescued his name from oblivion, and given a very interesting narrative of his labours. As to David Mushet, he justly remarks that the extraordinary expansion of the Scotch iron trade of late years has been mainly due to the discovery by David Mushet of the Blackband ironstone, in 1801, and the invention of the hot-blast by James Beaumont Neilson, in 1828. An account of the indomitable energy and perseverance of Mushet, and his rise, through his own exertions alone, from the unimportant position of accountant at the Clyde Ironworks to that of a skilled assayer, whose advice was sought in all cases of difficulty, is given. His "Papers on Iron and Steel" are among the most valuable original contributions to the literature of the iron manufacture that have been given to the world. After referring to Mr. Mushet's efforts to produce steel by a cementation process, the author observes that among the other important results of Mr. Mushet's lifelong labours the following may be summarily mentioned:—The preparation of steel from pig-iron by a direct process, combining the iron with carbon; the discovery of the beneficial effects of oxide of manganese on iron and steel; the use of oxides of iron in the puddling-furnace in various modes of application; the production of pig-iron from the blast-furnace suitable for puddling without the intervention of the refinery; and the application of the hot-blast to anthracite coal in iron smelting.

The invention of the hot blast is, of course, the most important event recorded in the succeeding chapter—the biography of James Beaumont Neilson; and it would be difficult to find a more striking instance of the vicissitudes of inventors. Although possessed of an invention which has since been described by Mushet as "a wonderful discovery;" by Prof. Gregory as "the greatest improvement with which he was acquainted;" by Mr. Jessop, an experienced English ironmaster, as being "of as great advantage in the iron trade as Arkwright's machinery was in the cotton-spinning trade;" and by Mr. Fairbairn as an invention that "has effected an entire revolution in the iron industry of Great Britain," Mr. Neilson had the greatest difficulty in persuading any ironmaster to permit him to make the necessary experiments with blast-furnaces actually at work. The biographies of Bramah, whose hydraulic-press has rendered his name immortal; of Henry Maudslay, who invented the leathern collar, which enabled Bramah to perfect his press; of Joseph Clement, who was the first to introduce precision in the manufacture of machinery, are given in the same admirable manner, whilst those of the remaining celebrities which go to make up the book are entitled to equal eulogium. Mr. Smiles observes, after recording the progress of the men just mentioned, that while such were the advances made in the arts of tool-making and engine-construction through the labours of Bramah, Maudslay, and Clement, there were other mechanics of almost equal eminence who flourished about the same time, and subsequently in several of the northern manufacturing towns. Among these he mentions James Fox, of Derby, who was originally a butler, but displayed such taste for mechanics that his master (the Rev. T. Gisborne) eventually furnished him with the means of beginning business on his own account, whence he was enabled firmly to establish the still celebrated firm of mechanical engineers bearing his name. Matthew Murray's most important inventions were those connected with the machinery for heckling and spinning flax, which he very greatly improved. Mr. Richard Roberts, of Manchester, is one of the most prolific of modern inventors; he has contrived things so various as the self-acting mule and the best electro-magnet, wet gas-meters and dry planing-machines, iron billiard tables and turret-clocks, the centrifugal railway and the drill slotting machine, an apparatus for making cigars, and machinery for the propulsion and equipment of steamships; so that he may almost be regarded as the Admirable Crichton of modern mechanics.

Mr. Whitworth is another of the first-class tool makers of Manchester. The minute accuracy of Mr. Whitworth's machines is not the least of their merits, and nothing will satisfy him short of perfect truth. The narrative of Mr. James Nasmyth's invention of the steam-hammer contains much that is interesting, but there is, perhaps, nothing more amusing than the way he scotched a strike. He had put a clever brass founder to the lathe, against the custom of the trade, and in consequence the turners turned out, and prevented others from working. Nasmyth started for Scotland, and engaged 64 hands, bringing them with their families and furniture in a body. The resistance of the workmen was thus rendered useless; it very soon became clear that the back of the strike was broken. The men returned to their work, and the clever brass founder continued at his turning lathe, from which he speedily rose to still higher employment. Notwithstanding the losses and suffering occasioned by strikes, Mr. Nasmyth holds the opinion that they have on the whole produced more good than evil; they have served to stimulate invention in an extraordinary degree. Some of the most important labour-saving processes now in common use are directly traceable to them; and in the case of many of our most potent self-acting tools and machines manufacturers could not be induced to adopt them until compelled to do so by strikes. The closing chapter of the work is devoted to the biography of William Fairbairn, whose name is, perhaps, better known to the general public than that of any other contained in the book, owing to the high position in the scientific world which his perseverance has secured him.

"Industrial Biography" is undoubtedly calculated to make quite as favourable an impression upon the reader as either of Mr. Smiles's preceding works, concerning which we have already expressed a high opinion, whilst its popular character cannot fail to receive extensive patronage, and thus add to the gratification of those who have the honour of being mentioned its pages.

* "Industrial Biography: Ironworkers and Toolmakers." By Samuel Smiles, author of "Lives of the Engineers." London: John Murray, Albemarle-street.

GEOMETRICAL DRAWING.*

Mechanical Drawing, as a branch of education, has hitherto been, to a very great extent, neglected or overlooked in the schools and colleges of Great Britain and Ireland. The reason for this may, perhaps, be found in the fact that we are pre-eminently a practical people: the idea conceived by the engineer or the mechanic is at once commenced with on the large scale, and receives practical development under the guiding hand and eye of the designer, without having previously been committed to paper. This, it need scarcely be said, is not now so much in vogue as it was a few years ago; but, notwithstanding the improvement we have undoubtedly made in this respect, we lack yet, in a surprising degree, that familiarity with mechanical drawing which should most certainly be associated with our well-known character as a mining and manufacturing nation.

Mr. Binns' book is a course of geometrical drawing, and includes practical geometry, the use of drawing instruments, the construction and use of scales, orthographic projection, and elementary descriptive geometry. The work is in two parts, the former comprising the heads we have just referred to, and the latter contains orthographic, isometric, and perspective projection, the projection of shadows, the principles of shading, and the practice of making finished drawings. Mr. Binns has given us a good ground of work of geometrical drawing, and we can recommend the book to our readers as being one of very considerable practical utility. We must, however, point to the fact, that for mining engineers and managers we require a work on drawing which shall give at once the few plain rules for plan and section making, drawing wheels, pullies, toothed gearing, and for shading and colouring, and be, at the same time, stript as much as possible of technicalities and geometrical principles; such a work, illustated by practical examples, would be of great value to many practical men who have had but few chances of an elementary education in anything but arduous manual labour. We are not finding any fault with the book under review, but merely pointing out the necessity there is for another kind of book on drawing, and one more suitable for practical miners and mechanics. A book on "Mining Machinery," by Mr. Wm. Moore, C.E., Glasgow, was published some time ago, and is now, we believe, out of print. In this work the principles of geometrical construction required only to be applied to the many examples of various kinds of machines which were there given, and we should have been furnished with a book on drawing, which to the mining engineer, and to the colliery manager especially, would have been a valuable companion to the work of Mr. Binns. The book in question is, however, the best, and in point of plan and text the most simple, that we have any acquaintance with; and we congratulate Mr. Binns on having been so successful in the authorship of a work which was certainly very much required.

* "Geometrical Drawing." By W. S. Binns, M.C.P. Revised Edition. London: John Weale, High Holborn, W.C.

WASTE, NUISANCE, AND TRESPASS.

The value of a work, and especially of a legal work, cannot always be judged of by its title, or the work before us* would be passed over by many of the readers of the *Mining Journal* as not affecting them, although, in fact, it contains a vast amount of information, of which those interested in mines should be in possession. Mr. Yool explains the law relating to property in, and the grant of minerals, to minerals deposited by a stream, and to compensation for minerals under the Railway Clauses Act; and with regard to mines, he describes the legal rights to possession of mines, and the laws relating to the drainage of mines, drowned mines, trespass in mines, working out of bounds, and working so as to let down the surface. Upon each of these points he gives quite as much information as is likely to be required, more especially as there are ample references to the sources of more complete details.

The ownership of severed minerals vests, says Mr. Yool, in a similar manner to that of severed trees; and by custom a copyholder may have a right to take any material, such as limestone, marl, clay, or gravel, as well as trees, for repairs or the necessary purposes of his occupation; and it is possible that such a privilege exists without reference to custom. By custom, also, the proprietary right in minerals, &c., may be attached to a copyhold of inheritance or for life, with power to renew or nominate a successor, so that a copyholder may sell them off the manor. If there be a grant of lands, or of lands and mines expressly, a tenant for life or years may work mines already open, but may not open new ones. Lord Coke says that if there be no open mines, and a lease is made of the land, together with all mines thereon, then the lessee may dig for mines therein, otherwise the grant would be void; but the dictum is of doubtful authority. Open limestone quarries on land devised may be worked for estovers, but not for sale, the analogy to open mines not holding in such a case. There may also be estovers of other constituent parts of the inheritance, as turf, gravel, clay, and coal. A tenant for life, impeachable of waste, has a right to continue the working of mines, clay-pits, &c., where the settlor, or preceding tenant in tail, has done it, and he may sink new shafts for the purpose of following up a vein of coal; but it is very doubtful whether such a tenant for life has a right to open pits or mines which have been abandoned, or the preparations for opening which have not been completed. And there seems to be no authority whether a new vein or bed may be worked by means of an old shaft. A tenant for life, without impeachment of waste, has, of course, a right to open new mines.

The chapter on Nuisances, relating to support, is particularly lucid and interesting, comprising, as it does, the whole question of working mines beneath railways, canals, and similar works; but its length, and the niceties by which the decisions have been regulated, preclude us from giving a satisfactory abstract of it. With regard to the drainage of mines, it appears that although, as a general rule, a man is bound not to allow his drainage water to flow on to his neighbour's land injuriously, yet the owner of a coal mine, who works it in an ordinary and proper manner, is not responsible for a flow of water, which may thus be occasioned, into a neighbouring mine, the miner's maxim being that water is a common enemy, against which every man must protect himself. The practice is said to be that each owner works to the end of his boundary on the dip of his beds, and leaves a barrier of his own mineral on the rise. If an upper owner trespass upon the barrier of a lower owner, he is liable for the consequential damage, as well as for the value of the coal, but he is not bound to fill up the excavation which he has made; but the tenant of a colliery was restrained by his landlord from allowing a communication, which the tenant had opened with an adjoining mine in breach of covenant, to remain open. The existence of water in a drowned mine may produce an indirect benefit to the adjacent tenements. But as such a state of things is obviously accidental and temporary, no right can be acquired by prescription to resist the withdrawal of the water. In a case concerning the property of Lady Bastard, in the West of England, persons working mines insisted that, within a particular district, there was a right common to all miners to make drifts through private closes for the purpose of draining the mines. This right they were about to assert by cutting a trench through some property of Lady Bastard's, to prevent which, however, an injunction was granted. References to decisions in cases of working out of bounds are also given, and we believe that there are few points in connection with waste, nuisance, and trepass, in mines, which will not be satisfactorily elucidated by reference to the book.

Although we have only alluded to those portions of Mr. Yool's work which relate strictly to mining, the whole of the subjects mentioned in the title are equally well treated, the object throughout having apparently been to give the largest possible amount of useful particulars in the fewest possible words. The work cannot fail to receive extensive patronage.

* "An Essay on Waste, Nuisance, and Trespass, chiefly with reference to Remedies in Equity; treating of the law of timber, mines, lights, water, support, the construction of public works," &c. By G. V. Yool, M.A., barrister-at-law. London: Maxwell, Bell-yard.

MINING IN SOUTH AUSTRALIA.

[FROM OUR OWN CORRESPONDENT.]

Adelaide, Sept. 26.—The reports from the various mines in this colony are almost entirely satisfactory. Those especially from the great mines belonging to the Yudanamutana Company are, perhaps, the most encouraging that have yet been received, as they indicate an almost certain prospect of large and permanent wealth. The depth now reached, although not great as compared with older mines, either here or in England, is sufficient to show that something more than a mere surface deposit exists; and the nature of the country, and especially of the ore raised—rich black sulphuret, and oxides below the water-level—are confirmatory of this. It is worthy of remark, too, that while in some places the lodes became thinner as they went down, they have improved greatly as a lower depth has been reached, and present every indication of being settled. From the captains' reports, there must be now at grass ores to the value of many thousand pounds, besides what has been sent away. It is impossible at present to say much of the success of the traction engines, but a satisfactory trial of them has been made at Port Augusta. If they answer the expectations formed of them, they will materially enhance the value of the Yudanamutana Mines, and by facilitating the carriage of the ore, encourage the employment of more hands, so as greatly to increase the quantity raised, while at the same time the profits will be vastly augmented. The Spring Creek Mine, near Mount Remarkable, is yielding a fair quantity of good ore. The lode is 20 feet wide, but is at present dradgey, though, I believe, payable. About 70 or 80 tons of ore, worth on the average 30 per cent., are reckoned on when the stuff is dressed. A very large quantity of similar stuff is in sight, and can be easily broken out when the junction is effected between the shaft and the adit. Nearer the metropolis, within a distance of twelve miles, the new discovery at the old Adelaide Mine, close to the Montacute, is opening up a wonderful store of mineral wealth. The mine was recently purchased by a small company for 2000*l.* in cash, and a number of free shares. I believe now—within the first month of the company's existence, and although only four men have been at work, chiefly in preliminary operations—not a share could be bought for less than 700 per cent. premium! Ores of 56 per cent. produce, and virgin copper, have already been broken out from a splendid lode, accompanied by the finest imaginable gossen, which I am confident would yield gold in paying quantities. This mine was offered to Mr. Bonny, for the Great Northern Company, for 1000*l.*, but refused by that gentleman. Capt. P. Morrison, late of the Great Northern Company's mines, was the first engaged to give a professional report on the new discovery at the Adelaide, and he spoke in very high terms of it. He leaves to-day for England, *viâ* Melbourne, by the *Prince of Wales*. The Burra Mine continues to maintain its unrivalled reputation. The Oratunga Mine is about to be opened by the Great Northern Company. The Moonta is also progressing as well as ever. Some people say the present holders are anxious to get all they can out of it before the great question of the rival proprietorship is settled. The popular opinion here is pretty generally against the present holders; and, to say the least, the published evidence taken before the select committee of the House of Assembly, discloses some singular facts. The lavish distribution of free shares to gentlemen high in office, to editors of newspapers, and other *useful* persons, is somewhat supicious; added to which there is the acknowledged fact that the descriptions of the locality given to the Crown Lands department were "intentionally vague."

There is a strong feeling on the part of some that the Government, having given the leases to the present holders, are bound to maintain their position, and argue—rather on the *ad misericordiam* principle—that the credit of the colony will suffer if Government leases are to be upset. I do not think this would be the result, because greater caution would be exercised in future, and no such argument ought to have any weight; it should rather be held that "right must be done though the heavens should

all." And as to any claims for loss on the part of innocent shareholders, I fancy the present holders, supposing them to be wrongfully in possession, are worth powder and shot. Two new and promising mineral claims are in course of being opened within a few miles of the Moonta. The Karkarilla and Yelta Mines are gradually improving, but the lodes seem to run rather deeper there than on the adjoining Moonta Mines. In both, however, good ore-bearing lodes are being worked. The New Cornwall Mine is slowly improving, and many persons are confident as to the recovery of its former prosperity.

The mines in the Bremer district are rapidly rising again into importance. The Worthing Mining Company's Bremer Mine is steadily improving; the old Paringa, also, is being worked again with very satisfactory results. The old Kanmantoo and the West Kanmantoo are doing well, especially the latter. Operations have been resumed at Wheal Ellen, but at present there is nothing of importance to report with reference thereto. The mine is held in high repute in the neighbourhood, and great satisfaction is expressed at the recommencement of the works. This colony has, until recently, been rather unfortunate in its silver-lead mines, but for some 18 months past the Talisker Mine (of silver-lead), at Cape Jervis, has been worked with the most satisfactory results. The quantity of ore appears to be very considerable, and its quality splendid, varying from 50 to 70 per cent. of lead, and yielding from 55 to 65 ozs. of silver to the ton of ore. Only about 12s. per share has yet been called up, yet the shares are now worth 6*l.* each in the market, and are rising in value. The mine has been worked almost entirely by men without capital, so that these facts of themselves speak for its richness.

With reference to the occasional attempts to sell mines to English capitalists at prices beyond their value, the *Telegraph* daily paper, which contains the only regular digest of mining news in the colony, recently had the following remarks:—

"The English public do not yet seem to have adopted any means of informing themselves as to the genuineness or value of what is brought under their notice; and, although by exercising caution they may sometimes escape a loss, it is just as likely that by an excess of caution they miss an opportunity of securing something of real value. Perhaps if the Government were to establish a "board of mines," or authorise the Inspector of Mines to give a certificate respecting the value of mineral claims—so far as could be judged by surface indications, by the nature of the country, distance from a port of shipment, &c.—this might guide English capitalists in their speculations. In two or three years' time there will, doubtless, be a reaction in favour of the colony, and some means will be adopted to ascertain before purchase whether a mineral claim is worth working or not."

MINING IN AUSTRALASIA—MONTHLY SUMMARY.

ADELAIDE, SEPT. 26.—The last English mail having brought such favourable advices, the price of copper has improved, and sales have been made at 92*l.* per ton at the port.—No. 4 wire has further declined, and varnished has been sold at 13*l.* per ton. Bright is worth rather more. There is no change in galvanised iron. Hoop iron is rather firmer. —In coals there is no improvement of any consequence to notices. The last sale of Sydney was made at 25s. per ton on board.—The Assembly's Select Committee on the Tipara Claims, after sitting fifty-four days, reported that the proprietors of the Moonta Mine were in wrongful possession, and recommended the claim of Mr. Mills, one of the petitioners.—Mr. Herraves has been engaged to search for gold in this colony, on the following terms:—His expenses to be paid from and to Sydney, 1000*l.* a-year for six months certain, and the reward of 5000*l.* on discovering a payable field of the precious metal. A party of men will also be provided for him.—A coal miner of some twenty years' practical experience in England, and who has during the last seven years as a well-sinker tested various localities in this colony, is fully persuaded that coal exists in the valley of the Murray. He is now on the spot, near the north-west bend, engaged in boring operations, and wishes to raise sufficient funds to thoroughly prove the ground.

STEAM MACHINE FOR SAWING SLATE AND MARBLE.—At Mr. J Kellett's, Waymouth-street, we witnessed the performance of his steam machine for sawing marble, two huge blocks of which, from the quarries at Macclesfield, were placed under a frame containing a number of saws, and in the space of twenty-four hours were cut into beautiful slabs, which are to be used at the Congregational Church, North Adelaide. The invention, with its ingenious arrangements, reflects great credit on the proprietor and inventor. We may add it is the only machine of the kind in Australia.

THE YUDANAMUTANA MINING COMPANY.—Subjoined is an extract of a letter from the engineer of that company:—"On Monday last I got up steam in the first engine, "Yudanamutana" No. 3, and after working the engine unconnected with the propelling gear for an hour, I connected and ran out on the Stirling road about three-quarters of a mile and back. We got out of the deep loose sand with the slow speed on, and over the rest of the road at the rate of five to seven miles per hour. The *Orient* gave us three times three cheers and dipped her ensign to us as we started. I had kept the starting a secret, so as to have as few people around me as possible, leaving off one of the driving-wheels until ready to start. The result was a very satisfactory one indeed. On Thursday I had another engine (No. 1) ready, and at 4 P.M. started and got away from our store over the very worst piece of ground I could find. I had invited Mr. Mildred to come, and he rode on the engine with me. He was much pleased with the trip. We ran out about a mile, sometimes over the road, and at others on the scrub, and turned round the engine three or four times in a circle of 30 ft. diameter. This trial was also satisfactory. When I have the third engine (No. 2) I shall then prepare for the grand start, of which I shall give you timely notice."—*South Australian Register, Sept.* 26.

We have seen two beautifully-executed photographs of the Blinman Mine, proving beyond mistake or cavil the active operations now going on there. Immense heaps of ore are exhibited at grass, and every sign of active industry is apparent. We have also received from Capt. Anthony long extracts relative to the workings at Yudanamutana and Blinman. The reports are highly encouraging. The traction-engines for the Yudanamutana and Blinman Mines have arrived, and have been successfully tested.—*South Australian Advertiser, Sept.* 26.

The reports from the Yudanamutana and Blinman Mines are of a most favourable and encouraging nature, and there seems to be no sign at present of the ore running out as deeper levels are reached. On the contrary, we are informed that good solid lodes of rich black and grey sulphurets are found at the greatest depth yet sunk. We were shown two daguerreotypes of the Blinman Mine, just received, which give a good idea of the work going on. Fine piles of ore are to be seen at grass, and shafts, drives, stopes, whips, whims, horses, bullocks, and miners combine to make up a busy scene.—*South Australian Telegraph, Sept.* 26.

"I have no hesitation in saying that 100,000 tons of ore can be taken away from the Blinman Mine, and they will have more in sight than they have now. There have been two great improvements in the lower portions of the mine lately, and there will be more in number yet, as the mine opens, for no man or miner can say how wide the Blinman lode is, nor will anyone be able to do so for another year at least."—*Extract of a Private Letter from Adelaide.*

VICTORIA.—The returns from the various gold fields have kept up to the average, and the mining interest appear to be in a steady and prosperous condition. One piece of gold weighing 32 lbs., and valued at 1500*l.*, has been found at Mount Moliagul. Important discoveries of new quartz reefs are being made from day to day in the, as yet, little known country of the Upper Goulburn. A large population is collecting in the district, and the yield of gold is steadily increasing. Land is being surveyed there for a new township, and there is every prospect that it will be the centre of a new and permanent gold field. The silver mines, also, at St. Arnaud are being rapidly developed, with a probability of their being abundantly profitable to the proprietors. At the valedictory banquet given in Melbourne to his Excellency Sir Henry Barkly, his excellency, in the course of his remarks, stated that the yield of gold for the first six months of 1863 was some 60,000 ozs. in excess of that for the corresponding period of the preceding year.

As an argument against the theory that all quartz reefs become poorer as the depth of sinking in them increases, we may mention that a very rich lode has been lately struck in a claim on the far-famed Poverty Reef, at Tarnagulla, at a depth of 390 ft., and the yields from this are expected to be quite equal to any obtained from this reef. The reefs generally in this neighbourhood are now worked to great advantage, and 550 tons of quartz, consisting of lots from different claims, and crushed at one machine last month, averaged 1 oz. 19 dwts. of gold to the ton. The M'Ivor reefs, too, have been yielding largely; one lot of 22 tons, producing 156 ozs.; another, of 10 tons, 178 ozs.; a third lot of 33 tons from the same reef as the last, 125 ozs.; 12 tons from a different claim on the same reef, 137 ozs.; 14 tons from another claim, 130 ozs.; and, besides other very good returns, one of 235 ozs. of gold from 100 tons, out of one of the antimony reefs. Not many very good yields from the Bendigo reefs are announced; but last week a cake of amalgamated gold, weighing 261 ozs., was sold, the produce of about 15 tons out of a claim on the Eaglehawk reef. Nor has very much been done in that way on the reefs in the Castlemaine district, one lot of 57 tons, however, from the Vineyard reef producing 99 ozs.; and 85 tons from the same reef, 122 ozs. The Ajax Company had 183 ozs. from 100 tons crushed one week during the month, and 230 ozs. from 120 tons crushed last week, and so satisfied are the managers with their prospects that arrangements have been made to erect very powerful machinery for the crushing of the great bulk of poorer stone still untouched in their claim. The Daylesford reefs have not been so prolific of large returns as they used to be, but one of the companies there lately got 419 ozs. from 272 tons of stone. Last month the Port Philip Company, at Clunes, crushed 3150 tons of stone out of the Clunes Company's mine, with a yield of 1588 ozs. 6 dwts., thus keeping the average over ½ oz. to the ton.

The dividends in the Ballarat district have been well maintained, and of all the companies on the deep leads the Defiance is still paying the best. Thus, for the the last fortnight their dividend was 54*l.* per share, and for the previous fortnight 75*l.* The quantity of gold raised during this latter period amounted to 1018 ozs. The Koh-i-noor comes next, and for each fortnight of the mouth their dividend was 40*l.* per share. The Great Extended paid 34*l.* for one fortnight, and 16*l.* for the other; and the Prince of Wales 30 and 20*l.* for the same periods; but the latter company is now obtaining a large portion of its gold from quartz. The dividends paid by the Cosmopolitan Company were 20*l.* and 15*l.* per share, and by the Albion Company 20*l.* and 10*l.* for the same periods respectively, but these were far exceeded by other companies in the district, much less widely known by name; for instance, the Try-again Company, at Springdallah, having now cleared off the debt incurred during the unprofitable operations in search of the lead, last week paid a dividend of 70*l.* per share, and some of the quartz mining companies have been paying higher dividends than several of those specified. No great number of nuggets have been found during the month, but one lump of gold and ironstone, together weighing 32 lbs., was picked up within 4 ft. of the surface at Mount Moliagul, a few days since, and the gold in it was supposed, according to the first rough estimate, to weigh upwards of 20 lbs. Then at Korong a nugget weighing 50 ozs. was found, and more lately one of 56 ozs. near Maryborough. A smaller one of 23 ozs. was found near Dunolly, in the bottom of a prospecting shaft only 3½ ft. deep, causing, of course, a rush to the piece of ground opened so auspiciously. A nugget weighing 52 ozs. has just been found near Ballarat, and three weeks since the Great Extended Company obtained one of 69 ozs. from their claim. Last, but not least, comes a piece of pure gold, free from quartz or other impurities, and weighing 189 ozs., which was found in the Bendigo district.

AUCKLAND, SEPT. 1.—The following is a return of the gold exported from New Zealand for the three months ending June 30 last:—From Auckland the amount is 2173 ozs., and value 6756*l.*; from Nelson and Lyttelton 2027 ozs., and value 7858*l.*; from Wellington, Dunedin, and Invercargill 161,574 ozs., value 626,097*l.*: total quantity 165,773 ozs, total value 640,706*l.* The gold exported by Lyttelton was 13 ozs., the produce of the Nelson gold fields; the gold exported by Wellington was 25 ozs., the produce of the Otago gold fields; and that exported from Invercargill was 6169 ozs., also the produce of the Otago gold fields. The total amount of gold exported from Auckland up to June 30 is 4491 ozs, valued at 15,061*l.*; the total of all the gold exported from New Zealand is 994,342 ozs,, valued at 3,849 958*l.*

The correspondent of the *Times* says—The gold discoveries, more particularly in the provinces of Nelson and Otago, are rapidly extending. In Nelson some very rich deposits have been found in the River Mangles, and the diggings on the Rivers Buller and Wangapella are proving rich in the precious metal. The great drawback to the satisfactory working of the Nelson gold fields consists in the almost entire absence of roads. The country is very broken, extensive thickly wooded gorges and rugged precipitous mountains interposing enormous difficulties in the way of communication. The Government of that province have until recently been most incomprehensibly supine regarding the undoubtedly rich auriferous character of the country, but lately public opinion has induced a little more activity. The Nelson people are now seriously contemplating the construction of a railway to traverse the districts known to be rich in gold, copper, and coal. The Coromandel gold field, in the Auckland province, languishes under the effects of the war raging in that province, and most of the miners have left until quieter times. Gold mining in Otago has for the last three months been seriously interrupted by the severity of the winter.

Probably over a hundred lives have been lost during the winter by floods or the severity of the weather. But the worst part of the season is now over, and warm, genial days have lately prevailed. Mining operations are, in consequence, reviving in every direction, and the gold fields' population is in high spirits. Many new discoveries have recently been made, and the areas of the gold fields are rapidly extending. A new gold field, about 70 miles from Dunedin, in a north easterly direction, was discovered about three months ago, and about 50 0 persons are settled there, doing remarkably well. It is confidently anticipated that the ensuing season will prove a very brilliant one. The quantity of gold produced by the Otago gold fields during the current year is 405,831 ozs., and the exports of the precious metal 450,595 ozs.

AUSTRALIAN MINES.

KAPUNDA.—Sept. 26: The quantity of ores raised in July was 300 tons of 18½ per cent. average produce, equal to 55 tons of pure copper, exclusive of 100 tons of sulphur ore for flux—the quantity raised in August is estimated at about 400 tons nett weight of good percentage. The Buhl engine-shaft has been sunk 70 fms., and would be sunk 2 fms. further to afford room for the pumps, &c.; and it was expected that the pumping arrangements when complete would effectually unwater the mine above that level, and enable the workings to be much more efficiently and economically carried on. It is also intended to commence as soon as possible to drive cross-cuts at 7 fms. to intersect the various lodes at that depth. A very full and satisfactory report on all the other shafts and underground works is also to hand. All was going on steadily at the smelting-works, the furnaces being in full work, and a large supply of fuel was coming in. The make of copper for August was 77 tons, of which 41½ tons had been shipped per *Monarch*, and 31 tons per *Norfolk*, both from Melbourne to London, while freight had been engaged for about 120 tons per *Coonatto*, to sail the end of October.

YUDANAMUTANA.—The directors have advices from their superintendent, dated Adelaide, Sept. 26. He states—"The *Orient* is now taking in our copper ore. The *Countess of Fife* has gone up to Port Augusta, and I have engaged freight in her for 100 tons; another vessel has also gone up, and I am trying to secure her. There has been a very satisfactory preliminary trial of each of the three traction-engines, which were put to a very severe test over the Shingle Banks." Capt. Anthony reports, under date of Sept. 17—"Yudanamutana Mine: The lode in No. 1 shaft is large, and producing good stones of ore. The 10 is 54 fms. north of this shaft, and still driving. The lode is large and promising, but producing very little copper. The 'Big Bunch,' on the top of the hill, is still yielding the same quantity of ore per month, and of similar quality. —No. 2 Shaft: Here the 20 is being driven north; the lode is poor. The stope north of this level is very rich indeed.—Wheal Gleeson Mine, No. 1 Shaft: Here there is a great and decided improvement. The lode as it approached the water level diminished in size to a mere vein. Just as we cut water, we found there was a change both in the stratum and in the lode, and as we proceed the lode is improving in size and quality. Water was found at about 10 fms. from the surface. The shaft is down 15 fms., 5 fms. in waste ground, and the lode from 6 to 12 in in width of the richest black oxide I have ever seen. I have no doubt we have an excellent lode here. We intend sinking to the 20 in order to prove the lode to that depth. The 10, north of this, is suspended driving for the present, as the men are required to drive south to prove the lode between the shaft and a cross-course 20 fms. south. This level has passed through some good patches of ore, which seem to be the bottom of a good bunch now being stoped north of the shaft. This is a splendid bunch of ore, not a very large lode, but the ore averages about 40 per cent. as it is broken.—Section 1379: The perpendicular shaft is sunk 14 fms. from surface, and a level driven several fathoms west; the lode is from 2 ft. wide, containing good ore, and the stratum is completely interlaced with rich veins of oxides and carbonates of copper. I think this is one of the most beautiful strata for mineral I ever saw, and cannot fail to turn out a good mine in depth. On the whole, I think this mine is 75 per cent better than it was two months ago. On the mine, at surface, there are about 45 tons of ore dressed—say, 35 to 40 per cent—about 600 tons of good ore to dress, besides 200 tons of ore of 16 per cent, and 200 tons of other coarse ores.—Blinman Mine: No. 1 shaft is 10 fathoms from the surface; for 5 fathoms the lode was very rich, and held a perpendicular course; it then fell away to the west, at an underlie of 3 ft, in a fathom, and appeared to be in an unhealthy state, declining to a few inches in width. A cross-cut was driven west, and the lode was cut about 3 fms. from the shaft; here also it was small and poor. A level was then driven south on the course of the lode; it opened gradually into a wide and very rich bunch of ore. From this bunch in the back we have raised 500 tons of good ore, and the lode in the bottom is now 10 feet wide, of ore of 25 per cent. as it is broken. No. 2 shaft is 10 fms. from surface; here the lode held its course tolerably regular, at an underlie of about 18 in. in a fathom, and was, on the whole, a good lode. The lode between this and No. 1 shaft split into two branches, on the junction of which the bunch of ore south of No. 1 was discovered; the lode is 1½ ft. wide, of good quality. No. 3 shaft is 10 fms. from surface; for 5 fms. the lode was large and rich, and formed the north end of the big bunch; it then divided into two branches. On the western one the shaft was continued for about 2 fms.; then finding the lode went off west on a floor of 4½ ft. to the fathom underlie, it overran the lode altogether. We then drove west, and cut the lode 5 fms. from the shaft, and have driven on it to within a few feet of No. 2 shaft; for that distance it is very regular. There is a large quantity of good ore standing about the sides and ends of the shaft, and between it and the big bunch, and we are of opinion that there is yet an important branch of the lode lying to the east of this shaft. The big bunch begins at No. 3 shaft, and is worked south of this point 13 fms., and varies from 2 to 7 fms. in depth, and from 8 to 26 in. wide. It has yielded over 1500 tons of ore, and is still yielding a large quantity. On the whole, the mine never looked better. During the past month we have sent from this mine to port 67 tons of average quality ore, have about 100 tons to dress, and have piled for smelting about 300 tons. We are unable to make a nicer calculation of this quantity, as it is added to the piles of former months without being weighed. I consider we have raised ore enough during the past month to make fully 75 tons of copper. The stack of smelting-works is now 40 ft. from the foundation, and will be built 25 ft. higher, and will then be sufficient for four furnaces, one of which is in building, and will be ready in time for the stack."

WORTHING.—Sept. 26: The mine is progressing favourably. The 53, south of Legg's engine-shaft, still holds as good as ever. The 43 is completely dry, showing that the lode continues to be of a loose nature, and, no doubt, more productive than ever, from its appearance. We are now changing the pitwork, which will be completed in a week, and shall then recommence sinking the shaft for a 63. In the north end of the level the lode is as last reported. The 43, south of Legg's engine-shaft, has improved; it will yield about 4 tons of ore to the fathom. The stopes in this level hold good, and are larger than in the 33. We have one stope 24 ft. wide, ore all through, with leaders varying from 1 to 5 ft. wide, of yellow ore. The lode in Leon's is not so good as last reported, but still holds good in north end of shaft. The 33 cross-cut has been driven many fms. through small strings of rich yellow ore; it is proposed to suspend this, and take the lode at a deeper level, where it is believed the branches will meet together and make large deposits of ore, adding greatly to the value of the mine. The mine never looked so well, or promised so fair to make a great and lasting property. Regulus returned during the month, 40 tons; ore sampled, 200 tons. A great quantity of dredge put by for dressing, and when the new machinery is at work there will be larger returns. The dressing and smelting going on well. The new calciner is completed, and answers admirably. Another furnace will be commenced as soon as the materials are got together. Quantity of ore on hand 200 tons, and 36 tons regulus.

BON ACCORD (Copper).—The shaft it was resolved to sink in the south-west corner of the Bon Accord property had been carried down 10 fms, and levels therefrom at that depth in opposite directions, as advised by Capt. P. Morrison, were about to be driven. The ground to the depth attained had proved easy for sinking; at that depth it had become harder.

GREAT NORTHERN.—Capt. Garland, Sept. 16: Since my last we have driven east on the course of the lode from the main cross-cut; the branch is quite cut out about 3 ft. from the side of the cross-cut. We have driven 2 fms. 3 ft. without any branch, and, from present appearances, no change for the better is likely to be met with, consequently I have stopped this working altogether. We started the engine on the 5th, and forked the water on the 13th. I hope to have all our work completed, and to be able to commence sinking about the latter part of next week.

ENGLISH AND AUSTRLIAN (Copper).—Sept. 26: The quantity of coal at Koorinza was 210 tons; at Kapunda, 670 tons; and at Port Adelaide, 1727 tons, besides about 280 tons of wood at Koorinza. There are four furnaces at work at Koorinza, and five furnaces and one refinery at the Port, and the smelting operations were progressing satisfactorily.

PORT PHILLIP AND COLONIAL (Gold).—The substance of the advices received by this company has already been given on receipt of the telegram *via* Suez. The only additional fact to notice is the receipt of a remittance by this mail of 1500*l.*

SCOTTISH AUSTRALIAN.—West Cadid has sampled 71¼ tons of ore, averaging 13 per cent. of copper; the three mines being together sampled 105 tons. At the smelting-works there were 16¼ tons of copper nearly ready to be dispatched from the works, in addition to 11¾ tons shipped to England, and bill of lading of which has been received by this mail. The stock of ore at the works ready to be smelted amounted to 244 tons. At the Lambton Colliery all was going on satisfactorily. The fitting together of the wagons, however, seems rather a slower process than Mr. Crondace (the colliery viewer) anticipated. There will be large shipments of coal to South Australia, as there have had repeated applications for cargoes of the Lambton coal.

THE FORTUNE OF WESTERN AUSTRALIA (Copper).—Capt. Penberthy. Aug 30: On the 27th inst. I visited Champion Bay, where the *Hastings* is now unloading the machinery. I am happy to say the men have arrived all well, and am convinced it will be found far cheaper to work the mine with them than those formerly employed. The old working shaft is sunk to the 40; the lode has been from 4 to 5 ft. wide, and will produce on an average 3¼ tons of copper ore per fathom when taken down. Levels have been driven about 8 ft. south-west and 6 ft. north-east of shaft; the lode in the south-west is 5 ft. wide, producing 4 tons of copper ore per fm.; that in the north-east is not looking so well as when we commenced driving, but will shortly improve, as there is a good lode gone down in the level above; the water having increased we must suspend operations at this point until we get our engine erected and pumping-lifts fixed, which will be done with all possible dispatch. The stopes in the back of the 30 are working with six men, lode 3 ft. wide, and yielding 2 tons of copper ore per fathom, of good quality. The stopes in the bottom of the 20 are also working with six men, lode 2 ft. wide, producing 2 tons of copper and lead ore per fm.; and those at the back of the same are working with two men, lode 6 ft. wide, producing 4 tons of copper and lead ore per fathom. The ores dressed this month are—copper, 25 tons; and lead, 13 tons; and there is in store at the bay 100 tons of copper ore awaiting shipment.

GREAT BARRIER.—The directors have received despatches announcing the completion of the saw mill, and that the manager was in a position to receive orders for the Kauri timber. Samples of the boards have been exhibited in Auckland, and are said to be first-class. The dimension of the boards are 25½ ft. by 14 in., and 1 in. thick, while the manager says he can produce them 3 or 6 in. broader. These are stated to be the broadest boards ever cut in the colony by a circular saw.

ST. JOHN DEL REY MINING COMPANY.

The consecration, on June 15, of a church built by the company for the use of its Catholic population, formed the occasion for general rejoicing at Morro Velho, and the friendly feeling exhibited between the Brazilians and the British must be generally gratifying. Both Catholics and Protestants have now ample accommodation in the shape of religious and educational establishments, the company having also built a church for the Protestant portion of the community, and maintaining an English chaplain to officiate in the church and school. His excellency the Bishop of Marianna (the Rev. Dr. Viscozo), who had undertaken to perform the ceremony of consecration, arrived in a "literia vivas," accompanied by the Rev. Canon Cassio, and another priest, on the preceding day at Fernam Paes, and was received with due reverence by the superintendent and officers of the company and a detachment of the National Guard. Proceeding to Morro Velho, where his arrival was announced by hoisting the British flag at the Casa Grande, and at Bon Vista he was received at the lodge by Father Augusto, the Rev. James Armstrong, B.A., T.C.D., the company's chapiain; and Mr. Furst, who gave him a hearty welcome to Morro Velho. After robing, his excellency proceeded, covered by a rich canopy supported by English and Brazilian gentlemen, to the large saloon of the Casa Grande, where a neat altar, and the other requisites for the bishop's use, had been provided. The usual devotions being finished, "Te Deum" was given in an impressive manner by the band and choristers.

On the morrow (the day of consecration) a general holiday was given to the whole of the establishment, At 6 o'clock in the morning a salute from the Store Hill guns announced the beginning of the festive occasion, and from 7 o'clock some amusements and wrestling were carried on by the English miners on the "Brincade;" and in the meantime a large number of people assembled here and in the neighbourhood of the new church, which from its decorations, and being neatly illuminated the previous night, had attracted a great number of spectators. About 10 30 A.M. the invited guests from Sabara, Congonhas, and other places assembled at the Casa Grande. The company's blacks, men, women, and children, were neatly arranged on the Casa Grande lawn, dressed in their uniform "revista" clothing; the men in blue, with scarlet collars and caps, with white trousers; the women in white petticoats, with red turbans, striped scarfs gracefully thrown round their shoulders; and the boys and girls respectively dressed in a similar manner. The number present amounting to about 1300, almost covering the lawn, formed a most striking and pretty sight. It was observed by some of the visitors that there is not such a body of people in any other establishment in Minas Geraes, nor probably in the empire of Brazil. At 11 o'clock the solemn procession was formed at Casa Grande, and its exit was announced by the commencement of a salute of minute guns. All parts of the ceremony not absolutely requiring to be conducted by members of the Catholic church were undertaken by an equal number of Brazilians and British. The formal part of the ceremony concluded, high mass was performed by the Rev. Canon Cassio, with pontifical assistance and the aid of the church band and choir, for which an orchestra had been temporarily erected in the western end of the church. His Excellency then preached an appropriate and very impressive sermon on the opening of the church for public worship, explaining fully and plainly the nature of the office performed. The advantages of having such a building were then pointed out; and, lastly, the conditions and objects to be kept steadily in view by those who frequent such places as are thus dedicated to the public worship of the Creator and Redeemer of mankind. The sacrament of consecration was then administered by his Excellency to a considerable number of persons, both old and young, belonging to the company, and also to many Brazilians from the village of Congonhas and the neighbourhood. After this was concluded the congregation was dismissed by his Excellency with the pontifical blessing. The service was completed by 3 P.M. His Excellency, suite, and guests then returned to the Casa Grande. The church is a neat but plain Gothic building, being 109 ft. long, 40 ft. wide, and 20 ft. high, having 13 large gothic windows, 10 ft. 9 in. by 3 ft. 9 in., and a vestry on the north side near to the eastern end, where the altar is placed on a raised platform, three steps above the level of the floor. This is the largest church attached to any property, or provided by any proprietor in Minas Geraes. During the 43 years that his Excellency has been engaged in ecclesiastical duty in Brazil there has not been any consecration throughout the diocese equal to the one now celebrated in Morro Velho.

The bishop, the priest, the guests, and the officers of the company, forming a party of 49, dined in the large saloon of the Casa Grande, in which a long temporary table was erected, and beautifully covered for the occasion. After dinner the SUPERINTENDENT proposed the health of his Excellency the Bishop of Marianna, and coupled with it an acknowledgment which he desired to make on behalf of the board of directors of the ready and valuable aid his Excellency had at all times rendered them in matters of duty connected with the new church, now so satisfactorily consecrated for the large number of persons in the employment of the company. His Excellency's advanced age of 76, his long ministrations during 43 years in Brazil, and his well-known incontentation and piety had deservedly caused his Excellency to be esteemed by all who knew him. The superintendent concluded by proposing his Excellency's health, and that he may long be spared to bis office, and to exercise his salutary influence in the province.—The toast was most cordially concurred in by all present, and appropriately acknowledged by the bishop. The health of Monsenhor Padre Joze Augusto was also proposed, and well received, and the active and efficient part he had taken in the proceedings of the day was prominently acknowledged by the superintendent.

Major C. BROCHADO, as acting president of the Camera of Sabara, and on behalf of the Sabara gentlemen, took the opportunity to state how much they were indebted to the superintendent for his kind and courteous conduct and co-operation. He proposed the health of the president, and prosperity to the company of Morro Velho.

The SUPERINTENDENT acknowledged the many compliments paid him by Major Brochado, and explained that the trifling opportunities he had of showing his good will towards his Brazilian acquaintances were not worthy of being mentioned when compared with the uniform kindness he had experienced from them during the past five years, and which had also, he believed, been extended to his predecessors, the representatives of the board of directors since the period of the company's settlement in Morro Velho. After briefly referring with regret to the suspension of diplomatic relations between Brazil and England, which he hoped would soon be renewed, and pointed out how closely their mutual interests were identified in a commercial point of view, he proposed prosperity to the commercial and mutual interests of Brazil and England.

Dr. A. VAZ PINTO COELHO, public promoter of the municipal district of Sabara, spoke most warmly of the commercial prosperity, industry, and energy of the English nation, and concluded by proposing the health of the Queen of England, as the most enlightened humane, and wise of sovereigns.

The SUPERINTENDENT then proposed the health of his Imperial Majesty the Emperor of Brazil, after which the party separated.

ST. JOHN DEL REY MINING COMPANY (Limited).—Advices received Nov. 5, per *Magdalena*, from Brazil:—

Morro Velho, Sept. 29.—GENERAL OPERATIONS: Since the date of preceding advices our general work has been carried on with regularity and without interruption, excepting that occasioned by turning off the water from the Cristaes ravine, in order to cleanse that water-course. All the requisite arrangements being made, Saturday, Sept. 26, was appointed for the purpose of effecting the proposed work. The water-course was cleansed from its source into the works; several portions, where the rego had been widened as far as practicable when the water was running, were now completed and deepened; some improvements were effected in the inclination of the older portions of the water-course; a few inconsiderable leaks were discovered and stopped; a new breastwork and overflow, of stone work, had been previously built at the end of the retiro launders, and three lengths of a new series of launders, of ironwood, provided and fixed on frames of the same material over the old launders. The arrangements for conveying the water into these new launders were completed; the old launders were repaired and caulked throughout; two new frames and one T-piece were provided and placed under the launders for strengthening them. Several sets of timber were put into the Boa Vista tunnel of this Rego, and the whole work was completed in the space of about 10½ hours from the time the water was turned off at the source of the water-course.

Advantage was taken of the water being off to employ all practicable mechanical force in effecting essential repairs to the reduction machinery. Two more sections of new backing were put on the Powles wheel, six new hoppers were fixed to the Lyon and Addison stamps, and a number of small general repairs done to the arrastres and other machinery. The eastern axle of the Hockin stamps was raised and levelled with the water-wheel, and new brasses and holding-down bolts provided and put in. A portion of the mine force was engaged in the service of the day, but the timberwork and stoping were conducted by the Englishmen in the mines, and the boring force of natives was employed in the regular work of boring. A very large amount of work was accomplished during the day, and though it is, of course, a present sacrifice of time and produce, the machinery being stopped for the 10½ hours here referred to, yet the general benefits which will flow from the improved working state of the rego, launders, and machinery, will soon compensate for the time bestowed on these essential repairs, and the improvements effected in our principal water-course.

REDUCTION DEPARTMENT.—During the past fortnight the supply of stone received on the spalling-floors has been pretty good, containing about the usual proportion of kilias, and affording sufficient mineral for the supply of the stamps. The spalling has been effected at rather under the usual guage, the water-power being diminished, occasioning slower rates of speed in the machinery, and in some instances several heads had to be suspended from want of sufficient water to drive the whole. The stoppage of the 26th inst. will, of course, reduce the duty during this division of the month. We have had two or three very acceptable showers of rain, and although it would be premature at this early period to regard these as any certain indication of the commencement of ho rainy season, still they have afforded us temporary relief, by augmenting the water supply received at the works. The quantity of sand received from the stamps, and treated by the amalgamation process, is about the average, and it has been brought through the process within the usual time required.

MINE.—The last fortnight of September has given us a very good and regular attendance of natives. The number of borers present has been quite equal to the requirements of the mine, and the supply of stone quarried has been sufficient for our hauling power. The sinking in the Cachoeira has been prosecuted with regularity, and also the stoping throughout the mine. The lode still continues contracted in the middle part, and contains the same proportions of kilias. There is no change worth noting in any part of the lode. From the East Bahu we still receive some kilias, the wedge in the first stope not being worked through, nor are we stoping eastward now in this section, so that we are not quarrying nor receiving the same proportion of ore from this part of the mine that we did some time ago. The stopes are being worked westward, where the ore is not so pure or rich. The timberwork throughout the mines has a large force employed on it, and considerable progress is being made in the heavier work. A good number of runners for inclined planes have been prepared, and several put in. The extension of the new incline-plane in the West Cachoeira is now in hand, with a good force engaged. The general work of the mine is going on steadily and well.

WEST QUEBRA PANELLA.—In driving westward an increase of water has been encountered, which rendered it necessary to put in a 6½-in. diameter pump, as the 4-in. one previously in use became inadequate to discharge the increased water. The sinking is now going on, and the stoping is prosecuted with a sufficient force for the space in this section of the mining work.

GOLD EXTRACTED TO DATE.—The produce of the stamps for second division of Sept., being a period of 11 days, is as follows:—

	Oitavas.	Tons ore.	Oits. per ton.
From General stamps	8057	from 1132·8	= 7·112
" Herring stamps (East Bahu)	2398	338·4	= 7·080
" Lyon stamps (M. & W. Cachoeira)	2717	388·8	= 6·988
Total stamps' produce	13,172	1860·0	7·081

The foregoing is better produce than the previous division gave, and the standard

yield is also higher than that of the month of August. The latter was 6 689 ozts., the above being 7·081 ozts. As previously explained, we are not just now quarrying in a favourable portion of the East Bahu, and hence the lower yield from the ore received from that section. The gold troop left yesterday for Rio de Janeiro, taking 17 boxes of bar gold, weighing 81,614 ozts., equal to 784 067 lbs. Troy. The rate of exchange on London being now above 2s. 2¾d., the agents are instructed to sell this gold to the Bank of Brazil, on the same terms as the previous remittance was disposed of to that Bank.

Advices received on Nov. 19, per French steamer *Bearn*, *via* Bordeaux:—

Morro Velho, Oct. 17.—PRODUCE.—The produce for the month of Sept. amounts to 39,788 ozts. It has been derived as follows:—

	Ozts.	Tons ore.	Ozts. p. ton.
From General stamps	21,726	.. from 3104·4 = 6 998	7·059
„ Herrring (East Bahu)	6,742	..... 948 8 = 7 105	
„ Lyon (Mid. and West Cachoeira)	7,591	..... 1054·4 = 7·199	
Total stamps' produce	36,059	..... 5107·6	
Arrastre produce	1,431		=0·280
Praia produce	2,268		
			7·339
Total produce	39,758		

The foregoing gold return for September, being the result of 30 days' stamping, is rather better than that obtained in August, which had 31 days. Besides, as previously advised, the water was turned off the establishment on September 2d for the space of 10½ hours, and to this extent the 30 days' work was reduced. The ore reduced, owing to the decreased water-power, is less than in August, but the standard yield of that treated in, on the whole, better, being 7339 ozts. per ton, as compared with 6689 ozts. per ton obtained in August. The yield from the three separate sections of the ore now under treatment is practically the same; so that no advantage has been derived from the ore in the East Bahu during the present month's produce. Taking into account the shorter time the stamps worked in September, and the quantity of ores pulverised, the return of gold for the month is quite up to the average yield from the mineral treated.

COST AND PROFIT.—The gold extracted is 39,758 ozts.

Deduct loss in melting	170 ozts.	
Leaving bar gold	39,588 ozts.	
Which at 7s. 9d. per ozt. amounts to		£15,340 7 0
The cost for Sept. is Rs. 89,885 $327, at exchange 2s. 3d.		10,112 2 0
Thus leaving a profit on the month's working of		£5,228 5 0

MINE.—The native attendance during September has been very good. In the Cachoeira Mine the sump has been sunk 5 ft. vertically, and the shaft has been extended one piece. On the east side of the sump, close to the shaft, the stoping cannot, *pro tem*, be carried on, as the inclined plane above requires extending a couple of sets to command this point. The East Cachoeira is, with this exception, being stoped regularly. In the Middle Cachoeira the lode continues contracted, and contains, on the north side, a large proportion of killas and lodey matter. The north wall, at the same time projecting greatly, causes inconvenience in the stoping, and still more so in keeping the hauling stations right, and the kibble-ways free. The West Cachoeira stoping has now reached the place where the stoping eastward in the Bahu reached into the Cachoeira. In the Bahu Mine 4 ft. have been sunk in the sump, but there has not been any stoping eastward nor driving towards the Cachoeira. The lode throughout this mine is large and good; it does not present any change in size or quality. There has been a large amount of timberwork effected in the Cachoeira, both as regards repairs and new work. The new incline plane in the western part is being rapidly extended, being close to No. 14 stull. Some important repairs have been done to the inclined planes, and many cross-pieces and runners renewed during the month. The new series of runners have been completed and fixed for the lower end of Schneider's incline, only awaiting opportunity to connect them with the upper and straight part of the line, and thus get rid of the crooked and inconvenient runners hitherto in use there. There has been a good force constantly employed on the timberwork, and the general work in both mines has been carried on with regularity.

GOLD EXTRACTED TO DATE.—The produce of stamps for the first division of October, being a period of 11 days, is as follows:—

	Oltavas.	Tons ore.	Ozts. per ton.
From General stamps	7,348	.....from 1162 0 =	6 328
„ Herring (East Bahu)	2,700	..... 360·8 =	7·483
„ Lyon (W. & Mid. Cachoeira).	2,728	..... 383·2 =	7 118
Total stamps	12,776	1906·6 =	6·700

The supply of stone from the mine was short on one occasion from breakage in the hauling-chain, and a short attendance of borers on the "pay-day," and Monday after. Advantage was taken of these circumstances to have several repairs effected to the water-wheels and stamping-mills, which were occupied by the mechanics about 8½ hours.

TERRICCIO COPPER MINING COMPANY (TUSCANY).

The first ordinary general meeting of shareholders was held at the offices of the company, 6, Old Jewry, on Nov. 13, when the following report from the directors was submitted:—

Although the present meeting has been convened more especially to come within the provision of a clause in the company's Articles of Association, which decrees that the same shall be held within a certain time after the incorporation of the company, the directors feel that they must profit by the opportunity thus afforded them, and place before the notice of the shareholders a few remarks as to the present state of the mine, and the financial condition of the company. At this early period it could not be expected that the directors should report any actual results. It would have been satisfactory to them had it been in their power to assure the shareholders that the works hitherto carried on at the mine had resulted in the finding of profitable material. That they cannot do so is owing to the fact that the outlay both of time and of money has been as yet insufficient to produce such a result, and, although from the indications already apparent there is reason to believe that the lode is near, some months must still elapse before any profit is realised. Such delay must be attributed to the fact that the operations at the mine are conducted with the strictest regard to economy both of material and labour; so many men only being employed as are sufficient to accomplish the steady driving of the various levels, in accordance with the instructions of the managing director. The directors invite the attention of the shareholders to the report made by the deputation to Tuscany, in the month of September last, which notifies the organisation of a local board of direction in Leghorn, and provides for a careful supervision of the accounts on the spot, prior to their being entered on the books of the company in London. Also to the report of Mr. J. H. Hitchins, who was invited to inspect the works at Terriccio, on the occasion of his paying a professional visit to the neighbouring highly productive mine of Monte Catini, with whose geological conditions it is believed that those of Terricco will be found almost identical.

The following are extracts from the report made by the deputation to Tuscany:—

"The estate of Terriccio is situated on the western slope of a hill, about 25 English miles south-east of Leghorn, and at the time of our visit was approachable only by a carriage-road. The Maremmana Railway, which has since been opened, now runs within about three miles of the mine. The chief seat of operations is at a spot about a mile distant from the Fattoria, belonging to Prince Poniatowski. A shaft has there been sunk to a depth of 70 metres (say, 220 feet), from which extend at various depths three lateral cuttings or levels of different lengths, each of which, it is presumed, will strike the filone, or vein of copper, at a greater or less distance, according to its dip of 50° with the horizon. The first of these levels occurs at a depth of about 42 metres, and extends for 130 metres in a south-easterly direction. The second has been carried 140 metres in a similar direction, and the third, now under water, to a distance of about 45 metres. In addition to these an inclined shaft has been opened at a distance of 20 or 30 yards, which cuts the first level at its extreme end, and is being continued in an oblique direction to meet the others, and facilitate the process of excavation. The object of our visit to Tuscany not being to furnish you with a technical report of the geological prospects of the mine, we shall briefly refer to the amount of work already accomplished, and give the result of our impressions as to the progress of the mining operations under the supervision of the managing director. At the mouth of the main (or Weber's) shaft is fixed a small pumping-engine, which works about three hours a-day, and serves for all the draining at present required. The stuff produced by the continued excavation is raised to the surface by a whim now worked by hand, an operation which would be avoided were there a suitable engine, capable of the double function of pumping and lifting. On descending into the levels we were impressed with the workman-like character of the excavation, and of the means employed to ensure the solidity of the tunnelling through the "gabbro," which is liable from its peculiar formation to fall in large masses, and obstruct the cuttings. At and near the end of the second level we found indications of great mineral richness, fine stones of ore being plentiful, with occasional native copper, and we cannot but coincide with your managing director in the belief that the manifestations of the presence of the mineral are such as to warrant great hopes of an abundant store of the right stuff being near at hand. We found the descent to the third or lower level impracticable, on account of the quantity of water which has been allowed to accumulate therein. Whilst on this subject, we may be permitted to observe that, although nothing can be more praiseworthy than the evident keeping down or all unnecessary expenditure in everything relating to the present working of the mine, there might be an increased chance of more speedily winning a remunerative product were the suggestion conveyed in Mr. Rickard's report adopted, and the mine worked in a more spirited manner, by the judicious employment of somewhat more effective machinery than that now at the disposal of the managing director. Although ground has been opened in other parts of the Terriccio estate, the workings are in too incipient a stage to merit notice in a report. It may be right, however, to mention that the new works in the Gonnellina Valley have reached a depth of about 25 ft., and that very fine stones of ore are already found there. This working, indeed, promises so well that a low wall, to protect the level from an irruption of water from the torrent, is now in course of construction, and the excavation is being steadily proceeded with. This spot is about 1½ mile distant from the main works at Weber's shaft. In conclusion, the members of the deputation feel it to be their duty to record their complete satisfaction at the progress of the mining works under the present management, and their belief that the interests of the shareholders are in every way in safe hands."—(Signed.) WILLIAM BEVAN, GEORGE H. HASLEWOOD, SAMUEL BEVAN, Sec.

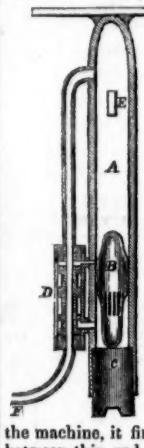
The following are extracts from the report of Mr. J. H. Hitchins:—

"It is very important that you possess a grant of such great extent as will command the working of the lodes within its limits for several miles in length, and to the greatest depth practicable, and also that your holding is for forty years, exempt from the payment of any dues, the grantor having accepted shares in your company in lieu thereof, which, in addition to the positional advantages and working facilities of your grant, cannot but be considered very satisfactory. Nor could I be otherwise than favourably impressed with the position of this mining property on finding that the well-known "gabbro rosso," together with the other accompanying and alternating rock formations prevailing throughout, are a continuation of the same mountainous ranges which constitute the great and rich metalliferous district surrounding the Monte Catini Mine, which for a great number of years has yielded, and still continues to yield, such enormous profits. The locally known "gabbro rosso," which is conspicuously distinguished by a high degree of crystallisation, is beyond a doubt the preponderating ore bearing rock of the district, none of the other differently constituted formations having been found to contain profitably productive courses or deposits of metallic minerals. It is at points where the rock in question is more crystallised than at others, and where it is broken by joints and veins, which act as feeders to the lodes, that the greatest and richest formations of ore occur. In acquitting myself of the duty assigned to me, it is fortunate that you will not have to be troubled with any lengthened remarks or explanations, for the reasons before assigned—that comparatively little only has yet been done in exploring and opening out the lodes of your very extensive grant. Although you have other lodes besides these now in operation, the latter only will be brought under consideration in this report, it being, perhaps, most advisable to defer working any other until the profits realised by the trials you have in hand will defray the increased expenditure that would attend an enlarged scale of operations. . . . . It devolves on me chiefly, then, to speak of your present trials, which are on rising ground, and but a little way from the valuable stream which runs through this portion of your property, being also on the right of the same going up, which position, however, will be best understood by the plans forwarded you by your agents. I found the total depth of your engine-shaft to be about 75 metres, nothing being done, however, below the second level, 40 metres deep only; which under existing circumstances, looking at the permanent and most advantageous working of your mine to such an increased depth, and on such an extended scale as will most likely be required for the realisation of permanently profitable results, leaves but little to regret, as there would be too far to drive from this shaft at the deep levels (the deeper the farther) for reaching the lode. . . . . After having in the fullest and most careful manner possible considered and reflected on all the points involved, I am most decidedly of opinion that the lode should be first seen 15, 20, or 25 fms. deeper—that is to say, below the second, or 46 metre level (depending of course, on its progressive development)—before any decision in regard to the sinking of the proposed new shaft should be come to. This will be the safest, as well as the quickest and least expensive way of proving the lode to the depth proposed, as in a very short time (allowing for what has been done since I was at the mine) the inclined shaft will be completed to the 46 metre level, after which it will admit of being very expeditiously sunk on the lode, rendering unnecessary any transverse drivages, and consequently saving the time and money they would require, being altogether a good trial, and likely enough to result in valuable discoveries, as was the case in Monte Catini, in which mine the lode at the same depth as the 46 metre level in this mine of yours was not a productive one, although of a promising general character, but not more so than the lode in the level just referred to. In both cases (taking similar depths) the mineralogical properties and characteristics of the lodes in question may be fairly said to be very desirably similar. . . . . At the different points of development the lode may be fairly taken as sufficiently well answering to the following description of its general character. It is from 2 to 4 and 6 ft. wide, having an easterly and westerly direction, and a southerly declination, composed of the same soft steatitic matrix, embodying balls of serpentine and ore of the same rich quality and peculiar rounded form before described, the vein also having the "gabbro" rock closely accompanying it, which is indispensably necessary to the productiveness of the lode in Monte Catini; in addition to which there is, and has been for some fathoms driving in the 46 metre level, on the wall of the lode, a small leading branch of ore, quite equal in quality to any ever met with in the rich mine just mentioned, such mineralogical properties, characteristics, and combinations being those of the vein of that mine before it was opened out at a sufficient depth, and proved such a valuable one. . . . . The continued sinking of the inclined shaft below the 46 metre level will be the all-important trial, and should be pushed with all possible energy, fraught as it is with the solution of the problem whether or not your mine, on being sunk deeper (that is to say, to the depth before mentioned), will prove a good mine, as Monte Catini did. It is much in your favour that this grant is situated in a district that abounds in timber suitable for mining purposes; and it is also too important to be omitted that there is plenty of cheap and efficient labour to be had. It is also very important that there is readily available such a supply of water as will do for for preparing and rendering the ores marketable, and flowing close to where will be the fittest place for such operations, so that it will admit of being applied in the most advantageous manner possible. Added to which advantages the railway in course of formation through the country from Leghorn passes within three miles of your mining operations, and will afford such a cheap conveyance of the ores to the shipping place, and working materials back, as will assist the expenditure. In conclusion, it cannot but be clearly inferred from the opinion that I have expressed in the foregoing statements, as in regard to the merits, inducements, and probable issue of your undertaking (not forgetting the positional advantages and working facilities of your grant) that I not only believe it to be a desirably safe enterprise, but, moreover, that I believe it will not fail, on being carried out in a judicious, energetic manner, to result in a permanently good paying investment."

SUGGESTED IMPROVEMENT IN PRACTICAL MINING.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—On Monday evening, at the meeting of the Liverpool Polytechnic Society, Mr. J. M. Gray described his patent portable riveting machine, which, although weighing only about ¼ cwt., or, with the "holder-up," less than 1 cwt., seemed a most efficient and valuable machine for the purpose intended. The machine had been previously tried during the day in the presence of the members of the society at the Vauxhall foundry, with which Mr. Gray is connected, and found to finish in a most superior manner one rivet in eight seconds; and, including the moving and refixing



A, cylinder.

B, piston.

c, swage-block for forming the rivet.

D, slide-valve.

E, a lever in a slot in the cylinder, by which the piston itself admits the steam in the upper part of the cylinder.

F, exhaust-pipe.

G, handle by which the workman lifts the machine, and guides it.

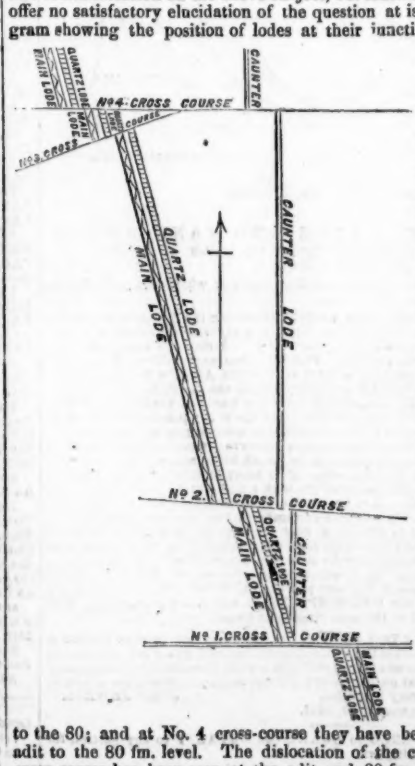
the machine, it finished three rivets in 27 seconds. The chief difference between this and other riveting machines is that the piston is entirely detached from the swage which forms the rivet, and which closes one end of the cylinder, being fitted with a hemp packing, through which it is free to move longitudinally when driven by the impact of the piston. The piston when at work moves to and fro in the cylinder like a shuttle, or a shot in a steam-gun, impinging on an obstacle immediately at its muzzle. The extreme portability of this little machine, and the great force it applies at the point of impact, repeating its blows with great rapidity—1000 per minute if necessary—suggested to me the possibility of applying it to the boring of holes for blasting in mines, as it could be worked by steam or compressed air; in the latter case it would not only relieve the miner of the most laborious part of his work, but would also assist in ventilating the working place. I send a small section, sketched from memory, which I think will convey some general idea of the machine, but hope to be able to furnish you with a correct drawing at a future day.

Alverton House, Liverpool, Nov. 17. W. RICKARD.

PRACTICAL MINING—POSITION OF LODES.

TO THE EDITOR OF THE MINING JOURNAL.

SIR,—I feel obliged to Mr. Brenton Symons for kindly noticing my last communication on the above subject, but consider his remarks thereon offer no satisfactory elucidation of the question at issue. I annex a diagram showing the position of lodes at their junctions with the various cross-courses in the mine, a glance at which will convince you that such an opportunity for thoughtful enquiry into the cause and effect of "faults" presents itself but rarely. I have named the different lodes agreeably with the phraseology used in the mine. The main lode dips east 2½ ft. in 6 ft., the quartz lode keeping a regular underlie with it. The caunter inclines east 2 ft. in 6 ft. Beginning with No. 1 cross-course, the plan shows the position of the lodes as seen in 13 successive levels, from adit downwards. At No. 2 cross-course the main lode and its companion have been seen, as described, from adit to the 70 fathom level, and the caunter at the adit, 40, 50, 60, and 70. At No. 3 cross-course the main lode has been seen in every level from the 20 to the 80; and at No. 4 cross-course they have been wrought from the adit to the 80 fm. level. The dislocation of the caunter lode by No. 4 cross-course has been seen at the adit and 20 fm. level. No. 3 fault is evidently a split-off from No. 4, for the caunter has been explored at the 20



north and south of No. 4 fault for a considerable distance without discovering the existence of No. 3. If the quartz lode has crossed the main lode surely some clue to the fact ought to be visible in one or other of the thirteen levels, but such is not the case.—*Carmarthen.* R. W.

FOREIGN MINING AND METALLURGY.

The situation of the Belgian metallurgical market continues excellent More and more numerous and important orders come to hand, and the terms of the last advance are accepted without any difficulty by buyers. Some sellers experience a great, and sometimes invincible, repugnance to engage themselves for long periods, so great is the confidence in the future which the present position of the market has induced. One cloud (and that a slight one at present) has troubled the confidence of producers—the monetary crisis, or rather the want of confidence which afflicts the monetary market—a matter indifferent in itself, but which has the effect of causing a rise in the rate of interest, and also of shaking credit, and diminishing the number of transactions. But industrials do not pre-occupy themselves much at present with these considerations of the future; they hope with firmness that the present tightness of the market will be only temporary, and of short duration: and it is very probable that events will confirm their opinion. For the rest, the present position of affairs is excellent; consumers and speculators do not find anything exaggerated in the rates now current; forgemasters see their establishments in activity; workmen are assured uninterrupted labour for the bad season; and it is, then, quite natural that the Belgian metallurgical market should not abandon itself to sad anticipations, and should not, by an excess of prudence, make the worst of the hesitating position of the monetary world. Thus the progressive course followed by the metallurgical market this year has not been affected by the symtome of crisis which have for some time paralysed the favourable tendencies of the public funds. Iron and pig are now dealt in at the rates given in former reports, and these quotations, now adopted by all the establishments, are firmly supported. Notwithstanding the rise, Belgian producers also find themselves able to sustain a competition with foreign on favourable terms. It is stated positively that orders have been given out to meet the requirements of English consumption, and that deliveries of Belgian siderurgical products will shortly be made to the United Kingdom. At Charleroi the current of affairs becomes more and more important. Orders arrive abundantly, as well from the interior as from abroad, and the prices of producers are generally accepted without difficulty. Good qualities of pig are especially sought after, and maintain themselves at the advance. Casting No. 3 makes 3*l.* 16s. per ton, with a scale of 2s. between numbers. A special quality, calculated to replace charcoal-made pig, and for which certain of the Charleroi works are renowned, sells for 4*l.* per ton for No. 3, and 4*l.* 8s. per ton for No. 1. Refining pig, hard iron, 3*l.* 4s. per ton; ordinary, 3*l.* 2s. per ton. The rise which has taken place in pig has not at present produced any change in the market for minerals. Oligiate have made 9s. 6d. to 10s. per ton, while hydrated minerals from Morialmé have brought 1*l.* 10s. 6d. to 1*l.* 16s. per ton, according to quality. Fraire have brought 1*l.* 8s. to 1*l.* 16s., and it is even stated that a contract has been concluded with MM. Baulet at 1*l.* 18s. 6d. per ton. The advices from Liége are at least as favourable. Contracts for pig on foreign account are stated to have been concluded at a rise of 2s. to 4s. per ton on the rates formerly current. The firmness of English merchants' irons has brought to Liége the orders of several Dutch houses, so that prices sustain themselves. With regard to the comparative movement of Belgian commerce during the first nine months of 1863 and 1862, it appears that the imports into Belgium have increased 8 per cent., while the exports have not materially varied. Some totals only indicate significant results. Thus the imports of iron minerals have this year attained a total of 124,269 tons, while in 1862 they were only 80,133 tons. This increase is due to importations from the Luxembourg, which develope themselves every day, and enter into the preceding totals for 112,469 tons in 1863 against 75,530 tons in 1862. The annexed figures show the course of the metal and coal trades; first with regard to the imports of the last three years to Sept. 30 in each period:—

	1863.	1862.	1861.
Unworked steel ..... Tons	1,347	1,415	1,514
Coal and coke	56,554	59,757	74,766
Rough copper	1,924	1,749	1,772
Iron minerals	124,270	80,133	25,372
Rough pig and old iron	5,996	2,850	2,155
Beaten, rolled, &c., iron	1,302	1,067	1,017
Engines and machinery	2,831	1,889	2,258
Rough and rolled lead	2,708	4,327	1,563
Rough and rolled zinc	3,319	2,610	2,962

The exports in the first nine months of the three years stood thus:—

	1863.	1862.	1861.
Unworked steel ..... Tons	140	46	91
Coal and coke	2,334,896	2,272,096	2,321,780
Rough copper	706	1,158	549
Iron minerals	165,647	153,500	116,419
Rough pig and old iron	17,440	26,530	22,217
Beaten, rolled, &c., iron	77,587	63,877	58,764
Worked pig	1,130	2,329	2,438
Engines and machinery	10,860	10,965	9,148
Rough and rolled lead	4,716	6,830	2,444
Rough and rolled zinc	17,040	17,998	17,245

Pig has experienced a better demand at St. Dizier. Local and foreign purchasers have presented themselves simultaneously, and the various orders received have had the effect of rendering the firmness of producers more easily sustainable. The article refining pig was recently quoted, nominally, at 5*l.* per ton; this price has now been ratified by transactions, and has become a real and positive quotation. A transaction involving 200 tons, to be delivered at St. Dizier, is noted. A more important contract has been accepted by a furnace in the neighbourhood of Joinville, the deliveries to be completed by instalments by Feb., and other affairs are in course of negociation. These operations denote confidence in the future, but it should be remarked that pig being at 5*l.* per ton, iron at 9*l.* 12s. per ton is below its proportional quotation. Pig, fabricated with a mixture of combustibles, is an object of rare transactions, the principal reason being that the proprietors of rolling-works prefer to produce it. The few transactions which have been effected are concluded on nearly the following terms:—4s. reduction on the price of charcoal-made, when one-fifth of coke is employed, and 8s. reduction when two-fifths are used. Irons are without change in price, rolled making 9*l.* 4s. to 9*l.* 12s., and hammered 10*l.* 8s. to 11*l.* per ton, according to marks. Orders, without being particularly animated, maintain work on a large scale in all the establishments. Machine iron is a little neglected; its price is 10*l.* for No. 20 and 9*l.* 16s. for No. 21. The present is not a favourable period in which to effect sales, but the next few months will probably display more clearly the probable future of the article. A sustained demand is noticed for iron-wire. A new blast-furnace, in course of construction at the Châtelier Works, will be lighted, according to all probability, at the end of this year. The St. Dizier basin is on the eve of possessing another wire-drawing establishment, which MM. Bonner and Jobard will put in activity in course of the current month at Chancenay, near St. Dizier.

At Paris the market for copper has been quiet, but is, nevertheless, tolerably firm, and there has been some demand even on terms above current rates. English in plates has made 99*l.*; Lake Superior, 112*l.*; Chilian, 93*l.* per ton. At Havre, Lake Superior follows decidedly the same movement as Chilian; one lot of Lake, Minesota mark, has obtained 116*l.*, and Chilian runs off easily at 92*l.* 10s. per ton. At Rotterdam the copper of the Society of Commerce has been dealt in at 54 fls. to 54½ fls., and refined Baltimore is held at 55 fls. Advices from Germany are tolerably favourable; at Hamburg fine qualities are sought after, and the greater part of the disposable stock of Paschkoff has been taken off at rising prices; in Drontheim some transactions have also taken place, but at less firm rates. At Berlin, Cologne, and Stettin transactions are tolerably active, and the quotations previously current have been maintained. The demand for tin displays little or no animation. At Paris, Banca remains at 125*l.*; Detroit, 122*l.* (f. eble); English, 115*l.* On the Dutch market the fall has continued, and Banca has given way from 71 fls. to 70 fls. At Hamburg tin remains without much demand, and is obtainable in large parcels at reduced rates. On the other German markets there have been few transactions, and prices have been feebly held. In lead an improvement has appeared, and holders generally maintain quotations well, although not many operations have been effected. Prices have been maintained at 21*l.* 6s., at Paris, for French, and at 21*l.* 8s. for Spanish. Amsterdam and Rotterdam have remained without much business, but have maintained preceding rates. Soft German remains firm at Hamburg, at the present high prices; the business done, however, has been small. At Cologne the article has been firm, and at Berlin it has also been in good demand. Zinc has been affected by the rise in the rate of discount at London. Rough Silesian has been quiet, at 18*l.* 16s., at Paris. At Hamburg zinc remains neglected, and present prices are considered nominal. On the Breslau market transactions have also been limited.

As regards the foreign coal trade, it may be noted that affairs continue to make good progress in the Couchant de Mons; deliveries by railway are more resorted to as freights remain very high, although there are some symptoms of an approaching fall. At Charleroi the same state of things prevails, but on the canal leading to that town the scarcity of boats diminishes. A letter from Mariemont says:—"The Carnières-Sud Colliery, which for 16 months past has been engaged in deepening its pit, has, after having traversed in succession seven beds of coal, of a thickness ranging from 20 in. to 36 in., just succeeded in discovering an eighth, 1 metre (40 in.) in thickness, and of excellent quality. The prosperity of this colliery is henceforth assured." The consumption of coal in Switzerland has largely increased of late years, as, indeed, has been the case with every European country. The greatest part of the coal is drawn from St. Etienne and Sarrebruck, and it enters the country *via* Geneva and Bâle. In 10 years the consumption has extended in an enormous proportion, the deliveries through Geneva and Bâle having been as follows at four different periods:—

	By Geneva.	By Bâle.	Total.
1850 ..... Tons	7,000	14,500	21,500
1854	11,000	22,100	33,100
1858	38,800	70,200	109,000
1860	75,000	152,000	227,000

Thus, in 10 years—from 1850 to 1860—the consumption more than decupled, and 1863 is expected to exhibit still further progress.

A writer in the *Journal des Mines* draws a striking contrast between the different circumstances under which industrial operations are carried on in France as compared with England. "Thus," he says, "Manchester Bolton, Leeds, &c., rest on a coal basin, and have coal worked in their immediate neighbourhood, while corresponding French towns, such as Rouen, Amiens, Elbeuf, &c., are 100 to 130 miles from the basins of the Nord and the Pas-de-Calais. The Cleveland metallurgical district touches the Newcastle basin, and iron minerals and combustible minerals are thus combined. It is the same with Glasgow, while the siderurgical group of Champagne, which has minerals without coal, is 125 miles from the basins of the Pas-de-Calais and the Nord. The Creuzot establishment is obliged to seek its minerals, at a distance of 80 miles, in the Bourbonbais and the Morvan; while Rive-de-Gier is obliged to obtain them from the environs of Privas, in the Ardèche, and the islands of Corsica and Elba. It is obvious, then, that the very conditions of French industry render it indispensable, in order to enable production to be effected at a cheaper rate, that upon a matter of primary importance, like coal, navigation dues should be suppressed."

The Belgian Company for the Construction of Railway Engines and Plant, a concern which formerly was known under the more humble name of "C. Evrard and Co.," has just held its annual meeting at Brussels. The report presented by the council of administration stated that in the eight months comprised between Nov. 1, 1862, and June 30, 1863, the company has completed the construction and delivery of a complete plant of engines, carriages, trucks,

turntables, &c., for the Novotcherkask Railway, in Russia. A great part of the carriages and trucks required for the first section of the North-Western of Spain Railway (from Palencia to Léon) have also been completed; and the delivery of a series of thirty locomotives for the Madrid, Saragossa, and Alicante Railway has been commenced. The company has also been occupied with the construction of some passenger carriages for the Belgian State lines, and of locomotives for the Saragossa and Pampeluna Railway. In the current exercise the administration has to complete orders for locomotives, carriages, and trucks for Spain, to commence the construction of a new series of locomotives for Portugal, and to prepare the rolling stock required for the working of the second section of the North-Western of Spain Railway (from Léon to Ponferrada). Independently of contracts concluded, the administration is engaged in negociations for others, and hopes to shortly introduce fresh elements of activity into the works. The profits of an exercise of eight months ending June 30, 1863, amounted to 7962*l.*, no very great result, but probably a respectable return, considering the competition which the administration has to encounter at the hands of similar undertakings established in Belgium.

Some copper foundries are stated to have been worked with success in Belgium during the last year or two. Steel works have also been created in this energetic country; and, although the first steps taken were surrounded with difficulties, a certain future has now been opened for the production of steel. About two years since an establishment for the treatment of foreign copper minerals was founded by some Liége industrials at Jemmappe, and other works for refining black Chilian copper have been created at Molenbeek-les-Bruxelles. A great extension has been given to this industry, for the prosecution of which a company has been constituted under the title of the Antwerp Metallurgical Company. The object of this undertaking is the casting and refining in Belgium and elsewhere of copper and all other metals drawn from foreign minerals. Belgium is not alone developing new branches of mining and metallurgical industry, as it appears that from 1831 to 1862 there were established in Prussia 89 companies, with an aggregate capital of 18,900,000*l.*, for the working of mines and metallurgical establishments. Nearly half of these companies were founded in the years 1855, 1856, and 1857, when a kind of industrial fever appears to have prevailed; but the Prussian Government has since done its utmost to maintain the prosperity of the newly-created establishments, by suppressing all administrative impediments which could injuriously affect their operations.

M. Aubrat, an inhabitant of the department of the Aube, has discovered in that part of France a rich vein of ironstone. Researches have not yet been made to a sufficient extent to indicate its full importance, but tolerably conclusive results have been afforded by analysis as to the strength of the mineral in metallic matter. Two analyses by the engineer of mines at Angers have yielded the following results:—The first showed 76 per cent. of peroxide of iron, 24 per cent. of silica, some traces of lime, and none of phosphorus or sulphur. The second gave 72·53 per cent. of oxide of iron, 14·20 per cent. of gangue, 13·27 per cent. of water, and neither lime, sulphur, nor phosphorus. An almost general amelioration has been noted of late in the French iron trade. According to the last advices which have come to hand from the East, the North, and Paris, it appears that quotations are hardening, and tend towards a rise. This is a current of ideas which gains in favour every day, and becomes with the majority a sincere conviction. The rise, which circumstances have been for some time preparing, and the signal for which has been given by the English market, has not been followed all at once by French producers, as they have prudentially desired neither to create nor adopt it unless an actual demand provoked it, and unless a large number of engagements consolidated it. In the last few months the railway companies have given out important orders, and some transactions are still in course of negociation. The trade, confident in a revival of activity, has accumulated, for its part, considerable stocks which it has a legitimate desire to run off at higher prices; in fact, interested in the rise, it endeavours to push it with all its force. This is the "situation," and under all the circumstances the rise has great chances of success. Prices in England have risen 1*l.* 10s. per ton in less than three months. Belgium has begun to raise its prices, and an augmentation of 12s. 6d. to 16s. per ton has taken place in some works. Prices in France have not yet profited from this amelioration in a sensible manner, but it appears probable that their turn is now come. For the last three years the metallurgical industry of France has been subject to the law of foreign markets, and French quotations have been depressed by the quotations and offers of England and Belgium. It is now argued that it is but just that French producers should turn to profitable account a situation which their foreign competitors have created for them without loss to themselves, since favourable conditions have placed them in a position to sell and make among themselves at a relatively considerable rise. At St. Dizier the orders for iron become more active. Certain works, as was stated recently, had reduced their prices to 9*l.* per ton, and there is now on the part of the proprietors of these rolling-mills a tendency to bring back their rates to the general tariff of 9*l.* 12s. per ton. Pig has only nominal quotations of 4*l.* 16s per ton, buyers, and 5*l* per ton, sellers; scarcely any business has been done. Iron-wire continues, on the contrary, in good demand. Advices from Paris confirm the rise anticipated for the last few weeks. The price of coke-made iron has been carried to 9*l.* 4s per ton by all the principal French establishments represented at Paris. The quotation, which was recently only that of a small number of warehouses, has become general; and this rise will probably involve prices in the provinces also. A letter from Havre says:—"The inexplicable feebleness in the quotations of iron in France, in presence of the good tone of the Belgian market, and of the increasing strength of that of Great Britain, renders importations difficult, if not impossible. Staffordshire and Scotch iron, known marks, arrive on our coast at 9*l.* 12s. without duty. Supposing warrants at 1*l.* 12s. to 1*l.* 16s. per ton (a price which we have paid, and which we can guarantee), we have a cost price in warehouse at Havre of 11*l.* 4s. to 11*l.* 12s. per ton. But the forges of the Moselle, of Commentry, and especially of the Nord, offer iron at 9*l.* 4s. per ton, delivered at the domicile, even for orders of ¼ ton to 1 ton, and it is evident that in important transactions a reduction would be obtained even on these prices. Whence arises this difference between the prices of French irons and those of English irons? Do not French producers believe that the opportune moment has arrived for establishing a rise? This struggle with the foreign trade—is its object to expel foreign competition altogether, or is it not rather the effect of internal competition? One is tempted to believe that this is the sole cause, and if the situation is prolonged, English products must yield the ground, not by an exhaustion of forces, but by the abandonment of a small market, which does not constitute an outlet of more than 2 per cent. for England. However this may be, Havre houses have confidence in the future, and no sales of Scottish and Staffordshire iron are now made below 10*l.* per ton; one of the most considerable establishments holds them at 10*l.* 16s. per ton."

MANUFACTURE OF TIN-PLATES.—In order to carry on more advantageously that part of the process of manufacturing tin and terne-plates where it is usual to pass them through heated grease to equalise and remove the excess of the coating, Messrs. Saunders and Piper, of Kidderminster, have patented an improved apparatus, which is thus described. A pair of rollers is placed and revolve in a shallow trough or vessel, and they are mounted in bearings, which are carried by levers pressed together by springs, so as to produce the desired pressure or nip to the rollers. The grease is retained in this trough or vessel to any desired height by means of an overflow-pipe, the delivery end of which may be raised or lowered to any required point. There is also a separate grease trough at one end, in which the necks of the rollers, their axes, and clutch-boxes revolve, from which also there is an overflow-pipe. The axes which give motion to the rollers are driven by friction surfaces, which are pressed together by a weighted lever. Below the trough in which the rollers revolve, and in connection therewith, there is a descending trunk, the lower end of which descends to the bottom of another trough, into which the tin or terne metal removed from the plates descends, and from it such metal is removed. There are openings at the lower end of the trunk through which such metal flows into the receiving trough below, whilst the melted metal in the lower trough supports the grease in the trunk, and in the upper trough or vessel. The coated plates are placed in succession into a portion of the upper trough or vessel, which is divided off by a partition, and each plate as it is introduced descends into the trunk, till its lower edge rests on a lifting-bar or cradle therein, and such plate is then caused to assume a vertical position in the cradle by fingers which are mounted on an axis above. These fingers give way as the plate descends in an inclined position into the trunk, and then the fingers by pressing against the plate cause it to assume a vertical position in the cradle, which is below the nip of the rollers. The lifting-bar or cradle is then raised by a lever handle, which brings the upper edge of the plate to the nip of the rollers, so that by the revolution of the rollers the plate is raised out of the grease, which is kept heated by any suitable means.

TREATING TIN ORES.—Some improvements in the treatment of tin ores has been patented by Mr. James Polkinghorne, of Redruth. He first treats tin ores with sulphuric acid and chloride of sodium, and keeps them in a heated state till the whole, or nearly the whole, of the iron, copper, and foreign matters and impurities are dissolved, or so reduced that they may be easily separated by washing. Four hours will generally be sufficient, but more or less time may be allowed. The progress of the operation may be ascertained from time to time by withdrawing a small portion from the furnace, or pan, and washing it in water, and then smelting the ore. When the ore has been sufficiently acted upon it is removed from the furnace, or pan, to be washed in water to separate from it the soluble and insoluble matters and impurities it may contain. In order to free the metal, by smelting, contained in the ores, he mixes 20 parts by weight of the ores, containing about from 60 to 72 per cent. of metal, with a flux composed of about from 3 to 5 parts by weight of culm, and from about 1-16th to ¾ of a part by weight of wrought-iron, wrought-iron borings, or turnings, or tin-plate clippings, and from about 1-16th of a part to 2 parts by weight of caustic soda, bicarbonate of soda, pearlash, or potash, according to the nature of the tin ores. The exact proportions must be fixed by a competent smelter, whose experience will readily enable him to apportion the proper doses according to the ores operated on. He smelts the mixture of ore and flux in an ordinary smelting or reverberatory furnace, as usual. He has likewise invented an apparatus for treating ores containing arsenic, to obtain the arsenic therefrom. His apparatus for obtaining arsenic from ores and other matters containing the same consists of a furnace surrounded by flues, with an outlet leading from the furnace into a chamber for collecting the gases. The ores, or matters, are fed into the retort through doors made for the purpose, or through shoots leading into and through the roof or upper part of the retort; a pipe is carried through and into the upper part of the retort, through which the arsenious gases are led into the usual poison chambers or flues.

ROBINSON'S SHARE TABLES.—The fourth edition of Mr. R. Edwin Robinson's very useful casting tables has just been issued by Mr. Effingham Wilson, of the Royal Exchange, and the clearness of the printing and admirable arrangement for reference cannot be too highly commended. The value of works of this nature is entirely dependent upon their accuracy, and upon this point a more conclusive proof cannot be given than a reference to the fact that the former editions have been well received, and they have proved to be in every way worthy of reliance. The tables give the values of 1 to 500 shares, at prices varying from 1s. 3d. to to 310*l.* Below 10*l.* the prices advance by sixteenths of the pound sterling, and thence by eighths. It is obvious that the tables are equally of value for the calculation of the value of consols, dividends, commissions, calls, and, indeed, almost anything required by parties dealing in shares or stock.

MONEY LENDING.—The case of Cross *v.* Graham, before Vice-Chancellor Stuart, was where the plaintiff, Archer Bernard Cross, an undergraduate at St. John's College, Oxford, had filed his bill against the defendant, Charles Graham, a money lender and bill discounter, praying for a declaration that the plaintiff was chargeable on certain securities for such sums only as had been actually advanced by the defendant, with interest at 5 per cent. The details were voluminous, but the short point decided by the Vice-Chancellor was, that where an account had been settled between parties with a view to a mortgage, which was not carried out by reason of exorbitant charge of interest, and where the alleged confirmation of the account was accompanied by pecuniary pressure on the plaintiff, the account was not binding on him. On the question of costs, however, the Vice-Chancellor said: "The plaintiff has come to be relieved from the consequences of his own folly and the extravagance of a reckless and vicious career. It is very true he has been dealing with a person who obtained benefits from that line of conduct. But I can see no merits on either side, and, therefore, I give no costs to either party."

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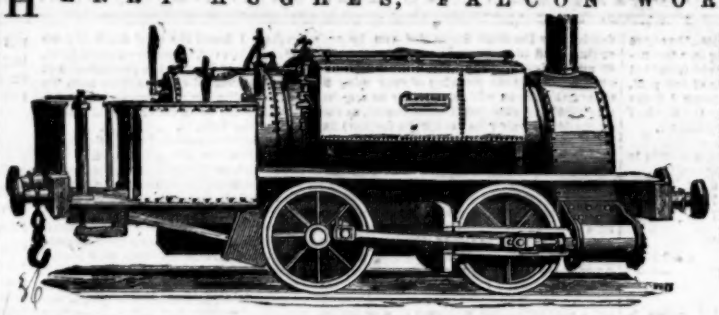

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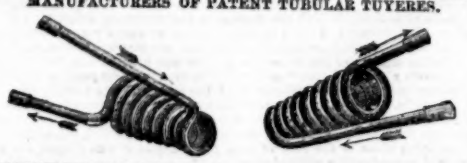

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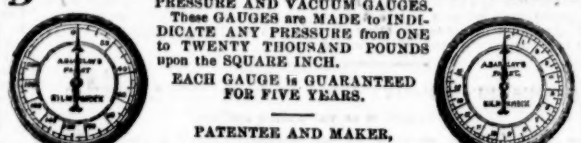

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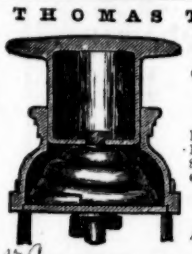

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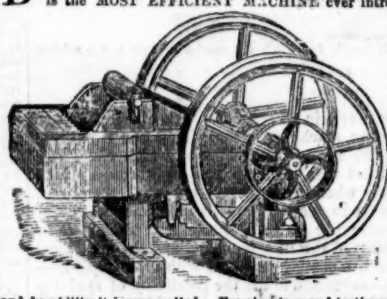

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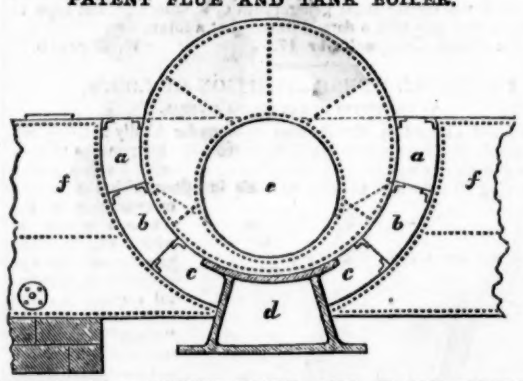

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The advantages of this boiler, an illustrated description of which was published in the MINING JOURNAL of October 3, are obvious.

It is provided with WROUGHT IRON FLUES, conveying the fire entirely over the surface of boiler below the water line, and wholly doing away with lime coming in contact with any part of the boiler, lime having been found to destroy the boiler plates before any other parts are the worse for wear. This boiler has four additional flues to the plan at present adopted, thus affording a FAR GREATER AMOUNT of HEATING SURFACE, and MORE EFFECTUALLY CONSUMING the GASES. Between the boilers a wrought-iron tank is fixed, extending the whole length of the boilers, for containing water for feed; this water will pass into the boiler at any temperature required. This boiler will not require anyone to enter the flues for cleansing, as the flues are provided with shifting stoppers at the ends, enabling a person to cleanse the flues even while the boiler is hot; this plan answers for any size or length boiler, and will do away with the cold water feed, which has been the cause of so many accidents. These flues are made of wrought or cast-iron. On the top of the tank a pipe will be placed, to take the waste steam that escapes and carry it to the cistern. The flues for a 6 ft. boiler will be 2 ft. long, and the usual width. It must be remembered that the tank once hot will remain a hot body, with the same amount of heat that passed off before in the brick flues. I would observe that there will be no more water taken from these tanks than will be required for the feed, consequently no more cold water will pass into these tanks than will be necessary for feeding. It is believed this plan will SAVE TEN FEET in the LENGTH of BOILER, and it has been proved to EFFECT a SAVING of rather MORE than ONE-THIRD in the CONSUMPTION of FUEL. These boilers, with flues and tanks, can be supplied on the most reasonable terms.

NOTE.—This plan of Flues and Tank Boiler will be found very beneficial for MARINE ENGINES; the tank would receive the water from the sea, and would not only become hot for feed, but would be the means of preventing in a great measure the salt from passing into the boiler. Where great quantities of hot water are required for other purposes, these tanks will also be found very beneficial. JOHN JEWELL.

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